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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,828	12/29/2003	Han-Hsing Liu	DAF009 US	7167

34036 7590 07/13/2006

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EXAMINER
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LE. DUNG ANH

ART UNIT	PAPER NUMBER
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2818

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/748,828

Applicant(s)

LIU, HAN-HSING

Examiner

DUNG A. LE

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on RCE dated 6/15/2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 22-25 and 27-32 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 22-25 and 27-32 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

The specification is objected to for the following reason:

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

In Claim 1, limitations “a silicide structure entirely covering said polysilicon structure”, “first lateral side walls” and “second lateral side walls” are not supported in Specification.

The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### **Claim Rejections**

#### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 22- 23, 27- 32 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Divakaruni et al. (6,326,260 Background of Invention) in view of Lee (6,352,934 B1).**

Divakaruni et al. teaches a polycide gate structure (figs. 4- 7 and related texts), comprising:

- (1) a polysilicon structure 16 formed upon a substrate 10 and having first lateral side walls;
- (2) an insulating structure 24/28/30 formed on said first lateral side walls for insulating said polysilicon structure 16;
- (3) a silicide structure 18 covering said polysilicon structure 16 and having second lateral side walls; and
- (4) a protecting structure 22 (col 5. line 30-35) formed by means of chemical vapor deposition (CVD) on said second lateral side walls for protecting said silicide structure 17.

Divakaruni et al. do not teaches a silicide structure 18 entirely covering said polysilicon structure 16 and having second lateral side walls.

Lee discloses a silicide structure 108 (figs. 1- 4, col 4, lines 10-15) entirely covering said polysilicon structure 106 and having second lateral side walls.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to form a silicide structure entirely covering said polysilicon structure in Divakaruni 's structure/device in order to improve the conductivity of the polysilicon gate (referto col 4, lines10-15).

**Regarding claim 23**, wherein said insulating structure 24 is silicon dioxide (SiO<sub>2</sub>).

**Regarding claim 27**, wherein said protecting structure 22 has a thickness ranged from 50 to 500 Å. (Divakaruni, col 5, lines 45- 46)

**Regarding claim 28**, wherein said protecting structure 22 is silicon nitride (SiN<sub>x</sub>) (Divakaruni, col 5, lines 42- 43).

**Regarding claim 30**, wherein said insulating structure 24 is formed by means of a dry oxidation method (Divakaruni, col 6, lines 15-20, and related texts).

**Regarding claims 29, 31 and 32**, wherein said polysilicon structure is defined via an anisotropic dry etcher, wherein said silicide structure is defined via anisotropic dry etcher and wherein said protecting structure is defined via an anisotropic dry etcher (Divakaruni, fig. 2, col 5, lines 15-30, and related texts).

**Claims 24- 25 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Divakaruni et al. (6, 326, 260 Background of Invention) in view of Lee (6, 352, 934 B1) and further in view of Lin et al. (2005/0156254 A1).**

Divakaruni et al. in view of Lee teaches the claimed invention as applied to claim 22 including the silicide structure upon said polysilicon structure comprises a barrier may be composed of a material such as SiN<sub>x</sub>, TaN, TaSiN, WN, TaSi<sub>2</sub> and other like material that can prevent diffusion of a conductor material therethrough (col 4, lines 38-45) except for silicide structure upon said polysilicon structure comprises a barrier, a tungsten layer and a silicon nitride (SiN<sub>x</sub>) layer in sequence.  
as cited in current claim.

Lin et al. teaches the silicide structure upon the polysilicon structure 12 comprises a barrier 22, a tungsten layer 24 and a silicon nitride (SiN<sub>x</sub>) layer 26 in sequence as cited figures 1-7 and related texts.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to the silicide structure upon the polysilicon structure comprises a barrier, a tungsten layer and a silicon nitride (SiN<sub>x</sub>) layer in sequence in Divakaruni et al.'s device because there can be prevent occurrence of holes in the polysilicon film, which would otherwise be induced by implantation, diffusion of a conductor material therethrough, heat treatment to be performed in subsequent processes.

**Regarding claim 25**, wherein the barrier is titanium nitride 22 in Lin (TiN).

When responding to the office action, Applicants' are advice to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung A. Le whose telephone number is (571) 272-1784. The examiner can normally be reached on Monday-Tuesday and Thursday 6:00am- 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, M. Smith can be reached on (571) 272-1907. The central fax phone numbers for the organization where this application or proceeding is assigned are (571)272-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DUNG A. LE  
Primary Examiner  
Art Unit 2818

